DOCUMENT RESUME

ED 442 473 JR 020 337

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TITLE	Norms and Standards for Computer Education (MCA, BCA) through Distance Mode.
INSTITUTION	Indira Gandhi National Open University, New Delhi (India). Distance Education Council.
PUB DATE	1999-10-00
NOTE	33p.
AVAILABLE FROM	Distance Education Council, Indira Gandhi National Open University, K-76, Hauz Khas, New Delhi-110016, India; Tel: 011-91-011-6569668; Fax: 011-91-011-6861340; e-mail: dec@nde.vsnl.net.in
PUB TYPE	Legal/Legislative/Regulatory Materials (090)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Academic Standards; Bachelors Degrees; *Computer Science Education; Correspondence Schools; *Distance Education; Foreign Countries; Higher Education; Masters Degrees; Open Universities; *Program Design
IDENTIFIERS	India

ABSTRACT

This document presents the norms and standards for computer education in India through distance mode, including the Masters in Computer Applications (MCA) and Bachelor in Computer Applications (BCA) programs. These norms and standards were considered and approved by the Distance Education Council, Indira Gandhi National Open University (India), at its 12th meeting held in December 1996. The following topics are addressed: curriculum design; eligibility criteria; admission procedure; duration; the measure of a course/program; modularity in programs; class size; teaching and learning strategies; nature of institutions; learning resources; student support services; delivery mechanism; evaluation; faculty; fee structure; content structure, instructional inputs, and processes; pre-counseling and career guidance; general considerations for evaluating the suitability of a computer education program such as the MCA or BCA; counselor training; infrastructural facility requirements; library; the BCA; and monitoring and performance review. A list of open universities and correspondence course institutions in India is included. (MES)

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NORMS AND STANDARDS FOR COMPUTER EDUCATION (MCA, BCA) THROUGH DISTANCE MODE

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Norms and Standards
for
Computer Education (MCA, BCA)
through
Distance Mode

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October, 1999

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Printed and Published by
The Director, Distance Education Council, Indira Gandhi National Open University, New Delhi-110016.

Printed at
Dee Kay Printers, 5/16 & 5/37A Kirti Nagar Indl. Area, New Delhi-110015.

The Norms and Standards

were

Considered and Approved

by

The Distance Education

Council

at its

12th Meeting held on

22nd December, 1996

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INTRODUCTION

Computer Education and Distance Teaching

The subject of computing is well-suited to self-learning. More than in any other field, self-learning by exploration and practice is the accepted mode for acquiring computer-related skills. The recent advances in computer and communication technology now makes it quite feasible to allow for interactive distance teaching and learning to take place in a reasonably successful manner.

Of course, this is still an experimental approach, which is relatively new and it is probably wiser to move with some caution. For at least some time, adopting the distance education approach for programmes in computer applications such as the Masters in Computer Applications course which emphasises applications and possibly provides some inputs from management allied areas may be appropriate for distance education mode at the moment. Few years down the line when the infrastructure is more well-established and information technology is ubiquitous, then it may be possible to present a good quality B.Tech programme as well.

Arising out of this kind of concern for the quality and standards in the distance education mode, the factors which are relevant and the parameters which are to be associated with the distance mode delivery of a programme to qualify for acceptance by the DEC are outlined here.

CURRICULUM DESIGN

Relevance of the curriculum to todays requirement is an important factor. DEC could sponsor annual systematic survey of the needs of the market for curriculum updates. Curriculum design should be discussed by an Expert Group which should identify core subjects and elective courses and problems for

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work practice. 'Theory of Computers' should be given importance and practice session should provide more insight into algorithms. For practicals, the credit points achieved by the learner should not be merely in terms of computer times but should be based on the skills acquired by the learner. It may involve different computer time for different learners depending upon his ability to achieve the skills.

ELIGIBILITY CRITERIA

The minimum entry qualifications for MCA Programme is that a candidate should be graduate with mathematics at 10+2 level. The candidates, who are graduates but do not have mathematics at 10+2 level may undertake preparatory computer courses to overcome the problem of mathematics background at 10+2 level.

Such students who do not fulfil minimum qualification can have coursewise registration and get certificate on completion of each course. In due course of time after a candidate clears all the papers, process may be built up to award the degree.

Attention was also drawn to the need for an alternative channel for direct evaluation and certification of talented candidates without having to go through a minimum study. It was proposed that a separate group may go into this question.

ADMISSION PROCEDURE

The students to MCA programme be admitted through entrance test. Learners with PCs or a group of students who can arrange their own hands-on practice facility may be given preference in admission.

The entrance test must test for abilities in self learning and an aptitude for computing. A central agency such as DEC/IGNOU or one created specially for this purpose could be responsible for this.

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DURATION

The MCA programme, would be of 3 years duration. However, a learner may be allowed to extend it over a period of six years, to accommodate individual needs and convenience of a learner.

THE MEASURE OF A COURSE/PROGRAMME

It is useful to agree on a common measure for the size of a programme. Since there has been a fair amount of experience with the measure of credit used by IGNOU, a unit credit being defined as 30 hrs of student effort, it may be useful to have the same as a measure for computer education programmes in the distance mode. The break-up of one credit worth of student effort, namely 30 hrs, would vary from course to course, and typically it would have the following components at the MCA level:

	Activities	No. of hrs.	Approx. % of efforts
(a)	Study time for print material including study books	8-10 hrs	33%
(b)	Time for watching a video related to the course, and carrying out activities related to it	watching 0.5 hrs activity 0.5 hrs	1.66% 1.66%
(c)	Participation in face to face counselling sessions	1.5 hrs	4.8%
(d)	Participation in video counselling whenever possible	0.5 hrs	
(e)	Working on Practical Assignments with Hands on computers	12.5 hrs	41%
(f)	Working on Assignments including studying the feedback provided	25 hrs	8%
(g)	Library/additional information activity	0.5- 1 hrs	1.66%

MODULARITY IN PROGRAMMES

Programmes should be offered on semester basis. A modular approach towards pursuing a long term degree programme is preferable to a long term commitment. Accordingly, the design of the course should be such that there are intermediate qualifications at the end of one year of study.

The typical load for one year should be about 32 credits and for a semester about 16 credits. The precise set of courses and programmes may largely be left with the institutions although a broad parity with the line of IGNOU's programmes may be desirable.

CLASS SIZE

There are no restrictions with regard to intake except the eligibility of the candidate as per admission norms and the resource base of the institution.

However, it is reasonable to set some numerical targets as follows:

(a) Maximum number of learning centres attached to each institute - 35±5

(b) Typical No. of learners attached to each learning centre - 40±10

TEACHING AND LEARNING STRATEGIES

The course material developed should be in Self Instructional Material format, broadly on the basis of the one accepted by the universities conducting similar programmes. Students should have more exposure to Algorithms and standards for hands-on/ practical should be ensured. Minimum contact hours be prescribed. It is also suggested that some specific problems be prescribed so that students are able to gain skills in the art of de-bugging the programme and machine usage is optimised during

hands on. This would also require a somewhat structural approach towards handling the practicals.

NATURE OF INSTITUTIONS

In the distance education mode, it may he necessary to distinguish between two kinds of institutions:

(A) Category A: those which develop and deliver programmes themselves and may also offer programmes developed by others and

(B) Category B: those which concentrate only on delivery of programmes, undertaking to deliver programmes developed by other institutions.

An Institution can start as Category B and may evolve and later develop as Category A.

Institutions can also be classified on the basis of those where the parent organisation is within India and those where strategic relations have been created with institutions and Universities including Open Universities abroad. The guidelines formulated herein would apply to all kinds of institutions described above.

LEARNING RESOURCES

The learning materials could he developed ab-initio and self-contained in all respects, or they could he built around one or more text books with study guides and other supporting material developed to have a wrap-around course.

The learning material forming the basis of the course should be despatched to the students address or mechanisms for him/her to collect from a specific place may be developed.

The major component, however, is the interactivity and access to faculty/counsellor/mentors who could respond to students' queries, provide feedback on assignments, organise discussion/ sessions and enthuse, motivate, encourage and facilitate the learner to successfully pursue the programmes.

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While the role of counsellors is very important, the ratio of counsellors to learners per course should be atleast 1:50. This should be supported by an automated system for responding to frequently asked questions from students. Also providing remedial feedback for submitted assignments should be a major factor for acceptability of a distance education programme.

Computer courses require extensive hands-on work. Provision for access to the required software on the appropriate hardware platform is also necessary. This access can he provided in a flexible manner and it may not be mandatory for the institutions to acquire the equipment on site. Students may even be encouraged to make their own arrangements for access to computers. However, certain minimum number of practical assignments for each course have to be done at the designated centres in the presence of counsellors. This should be a necessary part of the continuous assessment.

STUDENT SUPPORT SERVICES

For practical experience the availability of minimum number of PCs with institutes need not be a limiting factor. It should be the responsibility of the institutes to structure the number of assignments to achieve desired educational goals and fulfil the norms for hands-on. This would require access to minimum infrastructure facilities. Students and group of students can organise hands-on facilities on their own and in association with concerned institutions. DEC will also recognise institutions where students can go for practices.

DELIVERY MECHANISM

A distance learning programme should have a schedule of activities within prescribed time frame. The standard schedule should be as under:

(a) **Despatch of text-books and study material**: Within a month after finalisation of admission to the programme.

(b) **Receipt of completed activities/assignments**: Two to three graded assignments per course, per term.

(c) **Evaluation of Student Activities/Assignments and feedback to students**: Within four weeks of the receipt of assignments.

(d) **Response to students' queries**: Within a fortnight of receipt of query

(e) **Declaration of results after exminations**: Four to six weeks after the examination

(f) **Feedback to students** after their performance and progress in the programme; once in every semester.

The institution conducting the programme must have an efficient infrastructural facilities to manage the following activities:

(a) Timely production of study material

(b) Prompt despatch of material to students

(c) Computerised record keeping of students' performance progress and feedback.

The institution should maintain proper information system in relation to each of the above aspects.

A Distance Education programme must have inbuilt Quality Control mechanism to ensure the proper conduct and maintenance of the quality of the programme. This can be achieved by having a Board of Studies comprising experts from among the academicians and practitioners in the area of the programmes offered by the Institution. The Board of Studies may set up the following operational groups:

(a) An expert group to design, review and update the course curriculum and study material.

(b) An Examination Moderation group to check the proper conduct of examination and moderation of results.

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EVALUATION

Student evaluation system should be comprised of both continuous and end of semester evaluation. Participants would be required to go through an examination system, where either marks (%) or a letter grade system may be employed. For equivalence purposes, a 5 point or 9 point letter grade system may be employed. The components of evaluation for each course should include the following:

(a)	Assignments	20-30% weightage
(b)	End-term examination	80-70% weightage

Alternative model that could be considered is to have continuous assessment score for feedback and improvement purposes, but not included for final score.

The weightage for the viva-voce should not exceed 20% of the marks allotted to the project work.

The minimum qualifying grade for each course including project work shall be 50%.

Evaluation of the programme can be done in two ways:

(a) A centralised examination conducted by a common body set up for the purpose by DEC; or by an existing body such as IGNOU.

(b) Examination conducted by the institution independently.

In either case the following norms must be observed:

(a) The panel of paper setters and examiners may include academicians and practising experts who are not directly associated with the conduct of the programme in any other capacity.

(b) The security and confidentiality of the question papers and answer scripts must be maintained as in any University examination.

(c) The conduct of the examination must be arranged with one invigilator for every 20-30 students.

FACULTY

Computer Science is a very fast developing subject with ramifications for large number of subjects and needs dynamic faculty to manage it. Continuous upgradation of knowledge of faculty is necessary and it is recommended that faculty may go through refresher courses at regular interval of time.

A distance education institution requires staff at two levels. Full time core faculty supported by some part-time retainer faculty if necessary for Headquarters and part-time resource faculty for study centres.

Category A

(i) Full-time Core Faculty

The minimum core faculty should consist of one Professor, two Readers and four Lecturers.

Qualifications and salary scales should be in consonance with UGC/AICTE norms for such positions.

(ii) Part-time Retainer Faculty

Adequate numbers of part-time faculty to cater to all areas of specialisation. This faculty will be retained on regular basis to assist the curriculum and course material development and will function as anchor point in the area of specialisation at various stages of the programme, covering activities like preparation and periodic revision of study material, evaluation of assignments, responding to student enquiries, counselling etc.

(iii) Resource Faculty

A panel of suitably qualified faculty will be maintained to assist in the writing of study material, preparation of assignments and their evaluation, interacting in the personal contact programmes, counselling, field work guidance and evaluation, etc. This faculty will be judiciously distributed at various locations as per the strength of students and will be on assignment basis.

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Category B

A distance education institution such as of type B category mentioned in section 12 will require faculty as under:

(i) Full-time Core Faculty

It should comprise an academic manager, and at least two faculty well versed in editing and production of quality study material for each programme.

Qualifications and salary scales should be in consonance with UGC/AICTE norms for such positions.

(ii) Part-time Retainer Faculty

There should be an adequate number of part-time faculty to cater to all areas of specialisation. This faculty should be retained on regular basis to assist evaluation of assignments, responding to student enquiries, counselling etc.

(iii) Resource Faculty

A panel of suitably qualified faculty should be maintained to assist preparation of assignments and their evaluation, interaction in the personal contact programmes, counselling, field work guidance and evaluation, etc.

FEE STRUCTURE

Fees should be

(i) realistic but not extortionate,

(ii) related to a measure of what is offered i.e. per credit,

(iii) higher where software/hardware platform required is more expensive.

Based on the above three considerations, it was proposed that a fee range of Rs. 400/- to Rs. 600/- per credit per student would be in order.

Fee concessions to deserving candidates in accordance with GOI guidelines issued from time to time should be applicable.

There could also be differential fees for student who can organise their own access to Computer for practical work.

CONTENT STRUCTURE, INSTRUCTIONAL INPUTS AND PROCESSES

The course material that is developed could go through the normal stages of quality control. In terms of the content structure, the course must reflect a combination of a theoretical and conceptual foundations and allowing hands-on experience on related methodologies and an awareness and exposure to emerging areas. Some inputs from management related concepts and practices would also be desirable. However, care should be taken that there is no academic over-loading of the students. Courses could be categorised into compulsory and electives. There may also be components of skill-oriented training in specific packages which could add to the employability of the students.

PRE-COUNSELLING AND CAREER GUIDANCE

In view of the fact that the ease of admission to the distance education programmes is higher, the responsibility for making an appropriate choice of the programmes lies with the students. It is in this context that the availability of service or pre-counselling to the prospective student before he/she joins a programme is of great value.

Similarly, upon successful completion of the programme, the distant learner is relatively isolated in terms of job opportunities. Formal institutions have placement cells which facilitate employment of students and act as an interface for passing on the requirements of the employment market to the developers of the programme. A distance education institution offering computer programme should have a more active placement service which conceptually fine tune the programmes to enable students to have possibilities of reasonable jobs.

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GENERAL CONSIDERATIONS FOR EVALUATING THE SUITABILITY OF A COMPUTER EDUCATION PROGRAMME SUCH AS MCA, BCA

For programmes to be accepted professionally at MCA, BCA level the course contents and syllabus will broadly have to be in conssonance with those prevailing in the formal university system on the pattern formulated by AICTE. However, in order to maintain the quality and feasibility of delivery and an assurance that the desired learning can take place through the distance mode, a greater effort is to be made in advance planning of learning materials and systems. For this purpose the following considerations are relevant:

While evaluating an institution for delivering computer education in the conventional mode, emphasis is placed on full-time and part-time faculty, library infrastructure and laboratory facilities with special focus on adequate hands-on work on computers.

In the open learning/distance education system, the focus shifts to the development and use of learning materials with a greater self-instructional component to them, the use of work books and structured assignments for continuous learning, interaction between Counsellors and learners via contact proramme, video conferencing, computer aided learning etc. and a final evaluation by a term-end examination.

It is, therefore, important that accreditation/recognition of an institution to offer computer education programmes should approach DEC. A sub-committee can then do the evaluation of the learning resource materials as well as the document specifying various institutional processes. For this purpose the applying institutions would be required to submit a catalogue of learning resources which they propose to use and the requisite number of copies of the learning resources which may include inter-alia:

(i) Camera Ready Copies (CRC) of course material to be sent to the students;

(ii) Copies of printed books published by other publishers to be used as part of the course;

(iii) CRC of structured assignments both computer marked, tutor marked and project type;

(iv) CRC of model question papers to be used in final examination;

(v) Detailed methodology of conducting project work and final evaluation mechanisms be identified;

(vi) CRC of work books which will provide a structured approach to the acquisition of computing skills;

(vii) CRC of programme guides incorporating desirable information about the need to know the study skills required in Distance Education System, learner study plans and schedules;

(viii) Video Cassettes to be used as part of the learning material;

(ix) Audio Cassettes to be used as part of the learning material;

(x) Computer based training material to be used as part of the learning material;

(xi) CD-ROM to be used as part of the learning material;

(xii) Participation in any Video conferencing type activity for learner support;

(xiii) Use of any broadcast type facility either television or radio for learner support;

(xiv) Detailed plan of use of extended contact programmes for learner support;

(xv) Detailed plan for use of computer network mediated learning for learner support;

If any of such materials are to be used in collaboration with other institutions, requisite arrangements for permission to use such material for the specific purposes must be provided.

Evaluation of the suitability of the institution to offer a programme by distance mode will be determined by evaluation of these materials and the learning strategies proposed for the purpose.

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COUNSELLOR TRAINING

Apart from timely development of the course material, the two other issues which are very important for the delivery of computer education programmes through distance education mode are the issues of quality of counselling and access to computers.

(i) Requirements

The number of counsellors which may be required in the near future for various computer programmes is very large. The existing university norms for the ratio of counsellor to students for theoretical counselling is 1:60 whereas for practical counselling, it is 1:20. To serve as a role model for distance education, this ratio must be revised upwards to 1:30 or better still 1:20 for even the theoretical counselling also.

Counsellor be chosen from those who are either teaching computer programmes or those who have undergone a 3 months training programme developed especially for the purpose. The training programme would be through distance mode. Training of counsellors will be responsiblity of the Institution. The basic elements of training programme may include:

- What is distance education;
- Counselling practices;
- Evaluation of assignments;
- Key points of the various subjects which he has to counsel;
- Access to entire printed course material for the relevant course.

Teleconferencing facilities developed by IGNOU may be used for training purposes.

(ii) Duration of Programme

3 months with 15 days contact programme or one week intensive contact programme.

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(iii) Evaluation

There will be an assessment that is integrated into the Personal Contact Programme. No specific marks or raw scores will be provided to the candidates, but only a final certification of acceptability "Only Accepted as Counsellor - A or Not Accepted Retry - R" as a counsellor for a specific course in a programme.

INFRASTRUCTURAL FACILITY REQUIREMENTS

General Consideration

(a) The Centre should be able to take care of about 30-50 students who would practice on various softwares depending upon the course being pursued by them. The requisite number of hours per student would be laid down as per the course designed. However, as an emperical route, it would be necessary to have one terminal/PC per student enrolled for any programme.

Physical Facilities and Equipments

a. Headquarters

The space provided at Head Quarters should be sufficient for accommodating the following:

- Director
- Head of the Department/Director of School
- Faculty Members
- Visiting Faculty
- Conference/Seminar Room
- Computer Laboratory for hands on practice
- Library
- Administration and Support Services
- Storage of materials etc.

There should be sufficient space for moving around comfortably in the neighbourhood of the working area. While in metropolitan areas

because of high cost of space some cramping could be inevitable. Normally about 6000 sq.ft of floor area, inclusive of about 1000 sq.ft for the computer laboratory would be required for Category A institutions and about half of this for Category B institutions.

b. **Study Centre**

The minimum floor area for each study centre should be 1500 sq.ft including class room facilities.

Additional space requirements depend on intake, provisions of in-house desk-top publishing system etc. The illustrative list of required equipments will include telephone, computers, typewriters, audio-visual aids, over head projector, photo copying and duplicating machines. Desk-top publishing is desirable for distance education institutions.

(b) The environment which should be somewhat comparable with the professional environment in which the people would be working. While the following is not supposed to be a mandatory requirement, it is indicative of the kind of ambiance and infrastructural support that is expected for the computer laboratory.

Linoleum flooring, dust proof glass/wooden partitions, venetian blinds on windows/glass partitions, sun film on windows; flourescent lights etc. Electrical fittings including outlets for approximately 30 computers/terminal/printers with conduit wiring. 30 KVA electric power generator to support ACs, UPS, computers and associated peripheral devices. Separate earthing for all power supplied to computers, appropriate computer furniture, i.e. tables and chairs for 30 computers and cupboards to store consumable items and system manuals. Window or split ACs

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to provide ambient temperature of 25 deg. Celsius. 3 X 3 KVA UPS to provide regulated, uninterrupted power to equipment. Fire extinguishers and emergency lights in Computer room and terminal halls.

(c) There can be significant variation in the hardware available to an institute due to various reasons, and therefore, the following is a suggested mode of the required hardware. Since technology changes very rapidly (almost every year) these suggestions should be interpreted in the light of current available products in the market. Replacements by more powerful products should always be desirable.

(i) Pentium based servers driving a LAN with Intel 80486 on pentium based nodes. Older equipment should also be connected to the networks, if possible, to better utilise existing resources. Atleast one telephone line and modem for connection to external networks. If possible a multi-media station, which could even be a Power Mac with CD-ROM.

(ii) Direct Reception Set System Requirements

The following are the technical system elements required:

a) Dish antenna (Preferably 12 ft. diameter peforated dish)

b) Extended C-Band LNBC.

c) Satellite Receiver.

d) A normal colour TV set (bigger size is preferable for the viewing convenience of a large group).

e) Connecting cables and installation material

(iii) Laser Printer(s)

(iv) Dot Matrix Printers, 132 column, 24 pin, 250 cps - 12 nos. (80 and 132 columns)

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LIBRARY

While at one end one would wish that all institutions have a very well-equipped library, it is also true that journals and books especially foreign books are becoming more expensive. Therefore, the library should have a set of books especially low cost Indian editions of about 20-30 books for each course. It would be good to encourage the students to buy their own copies which they would continue to use as professionals. Reference and supplementary resource material should be more and more in electronic form and the library could be in the form of a CD-ROM based server with access from a number of nodes, possibly including the nodes in the computer laboratory. Subsription to Indian computer magazines would of course be necessary. Reference books on each course should be available with the institutions.

While it is not desirable to legislate on precise quantum of books on such resources, for those institutions which would prefer further guidelines on library books, computer based tutorials, video based instructions, further information on appropriate hardware and software, the possibility of providing such reports on payment by commissioning external consultants for the purpose may be considered.

BACHELOR IN COMPUTER APPLICATIONS (BCA)

(i) Eligibility Criteria

A student who has completed 10 + 2 or equivalent with Mathematics as a distinct subject would be eligible for admission to the BCA Programme. Those who do not have 10+2 with Mathematics should undergo a preparatory course to qualify themselves to take up the programme. The Admission will be based on merit in an **Entrance Test.**

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(ii) Duration of the Programme

The duration of the programme is three years; however a learner may be permitted to stretch it over a period of 6 years, if the learner's circumstances demand a longer duration.

(iii) Programme Structure

It is desirable that the Institutes follow the credit system for the Bachelor Degree Programme. **To successfully complete the BCA Programme, the student will have to earn 96 credits over a period of 3 to 6 years depending on the convenience.**

The basic structure of a Bachelor Degree Programme is given below as illustration and reference :

First Year : In the first year of study in the programme (after 10 + 2 or equivalent with Mathematics as a distinct subject), the student may take the following courses:

Sl. No.	Name of Course	No. of Credits
	I SEMESTER	
1.	Foundation course in English	4
2.	Foundation course in Humanities and Social Sciences	8
3.	Computer Fundamentals & PC Software	4
	II SEMESTER	
4.	Foundation course in English	4
5.	Calculus	4
6.	Elementary Algebra	2
7.	Analytical Geometry	2
8.	Data Structure through C	4

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Second Year : In the second year, the student would be required to take the following courses

Sl. No.	Name of Course	No. of Credits
	I SEMESTER	
1.	Foundation course in Science & Technology	8
2.	Introduction to Software	4
3.	Windows Programming	2
4.	Multimedia Computing	2
	II SEMESTER	
5.	File Structure and Programming in COBOL	4
6.	Elements of System Analysis & Design	6
7.	Database Management System	4
8.	Practicals on RDBMS (PROGRESS/ORACLE)	2

Third Year : During the third year, the student may take:

Sl. No.	Name of Course	No. of Credits
	I SEMESTER.	
1.	Parallel Computing	4
2.	Data Communication & Networks	4
3.	Internet & TCP/IP Programming	4
4.	Microprocessor & Assembly Language Programming	4
	II SEMESTER	
5.	Software Engineering	4
6.	C++ and object oriented programming	4
7.	Computer Graphics	4
8.	Project	4

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Thus the student would have during the three years acquired 96 credits, of which 48 credits would be said to be in the field of computer applications, and therefore, he/she would be given the Bachelor Degree in Computer Applications.

(iv) Practicals

Ist Year — Approximately 90 hours practical time is required for practice.

IInd Year — Approximately 120 hrs. practical time is required for practice

IIIrd Year — Approximately 150 hrs. practical time is required.

(v) Evaluation

Each of the courses comprising the BCA programme given above will follow the evaluation scheme in terms of continuous evaluation and term-end examination. The continuous evaluation may comprise TMAs, CMAs, short projects and term-end examination and may consist of theory as well as practicals. The respective scheme for each course would be followed.

(vi) Programme Fee

Fee should be coursewise and should be on credit basis. For Computer Course, it would be same as MCA programme and for courses which are not computer based should be around 30% of the Computer courses.

MONITORING AND PERFORMANCE REVIEW

Every Institution should evolve mechanism of quality assurance. Institutions should identify and publish a list of input, process and output indicators that they intend to use in monitoring and reviewing performance in distance education programmes against relevant institutional objectives. Each programme/course should have

- Clearly stated learning objectives;
- Carefully constructed learning materials;
- Well organised student support systems; and
- Explicit exit performance standards.

The effectiveness of a programme through Distance Mode to a great extent depends on its development, production and delivery operations. Hence it is required to evolve suitable and appropriate monitoring procedures for these activities. The appropriate nodal points may be identified in the organisational structure of the institutions and monitoring functions may be assigned to concerned person/organisation. Each Institution should devise proforma for self evaluation and forward a copy of the same at the end of each year of operation to the DEC.

DISTANCE EDUCATION COUNCIL

Expert Committee for Development of Norms and Standards for Computer Education Programmes (MCA & BCA) offered Through Distance Mode

1996

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- **Indira Gandhi National Open University,** New Delhi.
- **Dr. B.R. Ambedkar Open University,** Hyderabad, Andhra Pradesh.
- **Yashwantrao Chavan Maharashtra Open University,** Nashik, Maharashtra.
- **Kota Open University,** Kota, Rajasthan.
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- **Netaji Subhas Open University,** Calcutta, West Bengal.
- **U.P. Rajarshi Tandon Open University,** Allahabad, Uttar Pradesh.

Correspondence Course Institutions

No.	University/Institution	State
1.	Alagappa University	Tamil Nadu
2.	Andhra University	Andhra Pradesh
3.	Annamalai University	Tamil Nadu
4.	Awadhesh Pratap Singh University	Madhya Pradesh
5.	Bangalore University	Karnataka
6.	Barkatullah Vishwavidyalaya	Madhya Pradesh
7.	Berhampur University	Orissa
8.	Bharathiar University	Tamil Nadu
9.	Bharathidasen University	Tamil Nadu
10.	Birla Institute of Tech. and Sci.	Rajasthan
11.	Central Institute of English & Foreign Languages	Andra Pradesh
12.	Devi Ahilya Vishwavidyalaya	Madhya Pradesh
13.	Dr. Harisingh Gour Vishwavidyalaya	Madhya Pradesh
14.	G.B. Pant University of Agriculture & Technology	Uttar Pradesh
15.	Gujarat Vidyapith	Gujarat
16.	Guru Ghasidas University	Madhya Pradesh
17.	Guru Jambheshwar University	Haryana
18.	Himachal Pradesh University	Himachal Pradesh
19.	International Inst. for Population Sciences	Maharashtra
20.	Jadavpur University	West Bengal
21.	Jain Vishva Bharati Institute	Rajasthan
22.	Jamia Milia Islamia	New Delhi
23.	Jawaharlal Nehru Tech. University	Andhra Pradesh
24.	Jiwaji University	Madhya Pradesh
25.	Kakatiya University	Andhra Pradesh
26.	Kurukshetra University	Haryana
27.	Lalit Narayan Mithila University	Bihar
28.	Mahatma Gandhi Gramodaya Vishwavidyalaya	Madhya Pradesh
29.	Madurai Kamaraj University	Tamil Nadu
30.	Maharishi Dayanand University	Haryana
31.	Mahatma Gandhi University	Kerala
32.	Manonmaniam Sundaranar University	Tamil Nadu
33.	Maulana Azad National Urdu University	Andhra Pradesh
34.	Mother Teresa Women's University	Tamil Nadu
35.	Nagarjuna University	Andhra Pradesh
36.	National Law School of India University	Karnataka
37.	North-Eastern Hill University	Meghalaya
38.	Osmania University	Andhra Pradesh
39.	Panjab University	Chandigarh
40.	Patna University	Bihar
41.	Pondicherry University	Pondicherry
42.	Punjab Agricultural University	Punjab
43.	Punjabi University	Punjab
44.	Shivaji University	Maharashtra
45.	SNDT-Women's University	Maharashtra
46.	Sambalpur University	Orissa
47.	Sri Venkateswara University	Andhra Pradesh
48.	Tamil Nadu Agricultural University	Tamil Nadu
49.	Tilak Maharashtra Vidyapeeth	Maharashtra
50.	Tripura University	Tripura
51.	University of Bombay	Maharahstra
52.	University of Allahabad	Uttar Pradesh
53.	University of Burdwan	West Bengal
54.	University of Calicut	Kerala
55.	University of Delhi	Delhi
56.	University of Hyderabad	Andhra Pradesh
57.	University of Jammu	Jammu & Kashmir
58.	University of Kashmir	Jammu & Kashmir
59.	University of Kerala	Kerala
60.	University of Madras	Tamil Nadu
61.	Utkal University	Orissa
62.	Vidyasagar University	West Bengal

Distance Education Council

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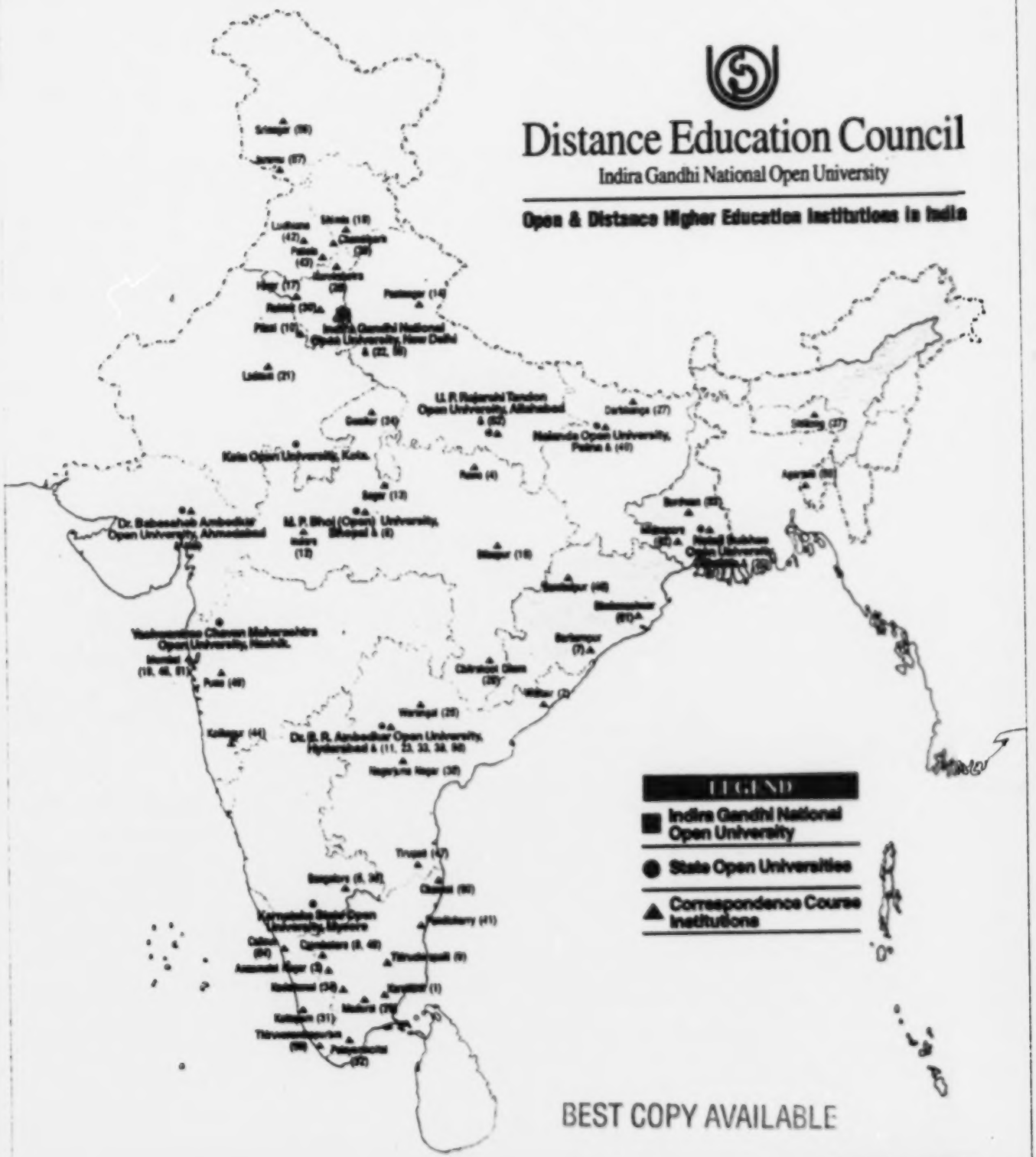
Open & Distance Higher Education Institutions in India


Indira Gandhi National Open University, New Delhi & (22, 58)
U. P. Rajarshi Tandon Open University, Allahabad & (62)
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